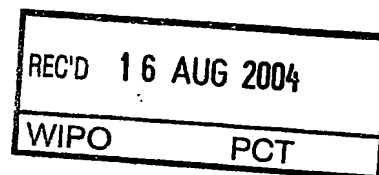


PCT/NZ2004/000149



## CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 15 July 2003 with an application for Letters Patent number 527017 made by COCOON CORPORATION LIMITED.

I further certify that pursuant to a claim under Section 24(1) of the Patents Act 1953, a direction was given that the application proceed in the name of BLOSSOM WOOL LIMITED.

Dated 2 August 2004.

**PRIORITY DOCUMENT**  
SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH  
RULE 17.1(a) OR (b)

Neville Harris  
Commissioner of Patents, Trade Marks and Designs



527017

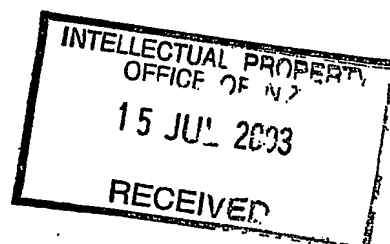
Patents Form No. 4

Our Ref: CC504402

Patents Act 1953  
PROVISIONAL SPECIFICATION  
PLANT LINER

We, **COCOON CORPORATION LIMITED**, a New Zealand company, of 181 Orakei Road, Remuera, Auckland, New Zealand do hereby declare this invention to be described in the following statement:

PT043723641



## Plant Liner

### Technical Field

5 The present invention relates to liners for plants and methods of manufacture thereof.

Throughout this specification, the term "plant liner" has been used in broad sense as a product that can be used in a growing medium, about or over a growing medium or as a growing medium for plants. Accordingly, the meaning of the term "plant liner" is not  
10 intended to be limited solely to a material that is to be placed inside an article.

### Background

Various types of plant liners have been proposed, each having their own characteristics and uses. The plant liners may be inserted into pots, placed under pots or themselves be  
15 formed into a plant pot.

Plant liners of the prior art have been made from a variety of materials, including rock and mineral wool and some plant fibres such as coconut fibres and sphagnum moss. Rock  
20 and mineral wool are synthetic products and as such are not particularly environmentally sound. Plant fibre plant liners may be difficult and/or messy to handle and may have limited applications.

It is an object of the present invention to provide a plant liner that provides improved  
25 properties and/or to provide a method of manufacturing a plant liner that has improved characteristics over plant liners and methods of manufacturing such at present, or at least to provide the public with a useful choice.

Further objects of the present invention may become apparent from the following  
30 description.

### Summary of the Invention

According to a first aspect of the present invention, there is provided a method of  
35 manufacturing a plant liner, the method including producing a batt formed at least in part from unsoured animal wool, needlepunching the batt to form a felt and forming the felt

into a required shape or length.

Preferably, the method may include forming the felt into lengths and winding the lengths into a roll.

Preferably, the method may include introducing seeds into the felt.

Preferably, the method may include using at least a portion of dag wool in each plant liner.

Preferably, the method may include forming the batt using at least 50% unscoured animal wool and in one embodiment, the method may include using substantially only unscoured animal wool.

According to a second aspect of the present invention, there is provided a plant liner constructed at least in part from a felt of needlepunched unscoured animal wool.

Preferably, the plant liner may be in lengths wound into a roll.

Preferably, the plant liner may include seeds lodged in the felt.

Preferably, the plant liner may include plant feed lodged in the felt.

In one embodiment, the plant liner may be constructed substantially only from the fibres of unscoured animal wool.

In one embodiment, the plant liner may be shaped so as to be formed or formable into an insert for a plant pot.

Further aspects of the present invention may become apparent from the following description, given by way of example only and with reference to the accompanying drawings.

#### **Brief Description of the Drawings**

Figure 1: shows a flow chart of the steps taken to produce a plant liner in accordance with the present invention.

Figure 2: shows a possible product made from the plant liner of the present invention.

5 Figure 3: shows another possible product made from the plant liner of the present invention.

### Detailed Description of the Invention

10 The present invention relates to plant liners and methods of producing plant liners. The plant liner of the present invention is constructed from unscoured wool, which has been found by the Applicant to provide a surprisingly good growing medium for plants.

15 Plant liners are intended to provide improved growing conditions for plants, often by retaining moisture in the location of the roots of the plants. Various plant liners and plant pots have been proposed to retain water about the plant roots.

20 The Applicant has identified that wool is highly hydrophilic, which is one of its properties that make it suitable for use as a plant liner. In addition, the Applicant has identified that unscoured wool contains nutrients that promote plant growth. Unscoured sheep wool typically contains Nitrogen, Sulphur, Potassium and Magnesium, making unscoured sheep wool particularly advantageous for use as a plant liner. In addition, and perhaps surprisingly, unscoured wool does not appear to promote bacterial and fungal growth after being moistened.

25 Referring to Figure 1, a flow diagram of the steps to produce a plant liner according to the present invention is shown. The first step, step 1 involves receiving a quantity of unscoured wool. Unscoured wool is already readily available for purchase. In a preferred form of the invention as presently contemplated, the unscoured wool includes at least a portion of dag wool. Dag wool includes a portion of animal faeces and may also include dirt and other contaminants.

30 The next step, step 2 is carding, a well known process to lay the wool fibres parallel to each other, forming a batt (web) of loosely associated fibres. A plurality of webs are superimposed on each other to obtain a required density and thickness, which may be between 4 – 20 cm for most applications. Those skilled in the relevant arts will

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appreciate that methods other than carding may be used to form a batt, for example air-laying or garnetting.

Step 3 involves needlepunching the batt produced in step 2 to form a felt.

Needlepunching involves inserting many barbed needles through the batt to change create a nonwoven fabric. Needle punching changes the orientation of the fibres in the batt from generally horizontal to generally vertical, at the same time causing the fibres to interlock. Felting needle looms and needles suitable for needlepunching wool are well known and therefore will not be described further herein.

Step 4 involves shaping the felt or rolling the felt onto a roll. It is anticipated that the felt will be produced in lengths, which are rolled directly onto a spindle 22 to form a roll 20 (see Figure 3). Required sub-lengths of felt from the main length 21 may then be removed from the roll 20 and cut into a required shape for use. For example, the felt may be cut into a shape so that it could be formed into an annular insert 10 (see Figure 2) for a pot.

The length 21 of felt formed into the roll 20 may be particularly useful as a geotextile, allowing relatively easy placement of large areas of felt, for example, by locating the roll on the back of a trailer or light truck. The roll 20 may be a convenient way to transport the length 21 to another location where retail products, such as the insert 10 may be produced.

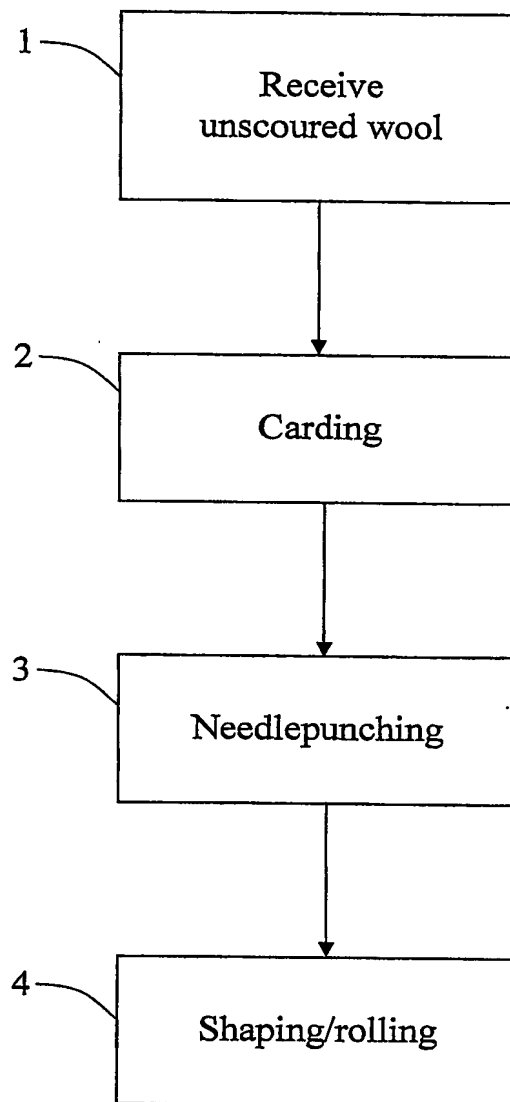
If a loose felt is produced, seeds may be shaken into the felt. The seeds may be shaken into the felt prior to forming a roll 20. The felt may then act as both a store of water to encourage growth and as a weed mat or mulch mat, discouraging growth of competing plants. A binding solution may be applied to the liner to assist in the retention of seeds in the felt. As an alternative to shaking seeds into the felt, the seeds may be inserted using a mechanical drill or may be applied during the needle punching process using specialised needles and looms. The wool felt may help to regulate the temperature of the seeds and/or the roots of established plants.

If additional plant nutrients were required, this may be achieved by shaking in the required fertiliser or other product. Alternatively, the felt may be drenched into a solution containing the required nutrients and allowed to dry.

Composite felts may produced including in part unscoured wool and in part one or more other suitable fibrous products. For example, plant fibres may be added to the felt in a certain proportion. The composite felt may be produced by mixing the additional fibrous product with the unscoured wool prior to carding. Alternatively, webs of different fibres may be superimposed onto each other to form a composite batt that is then needlepunched.

Where in the foregoing description, reference has been made to specific components or integers of the invention having known equivalents then such equivalents are herein incorporated as if individually set forth.

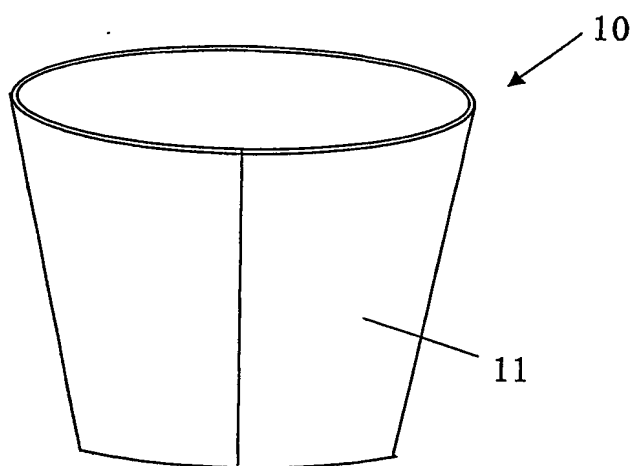
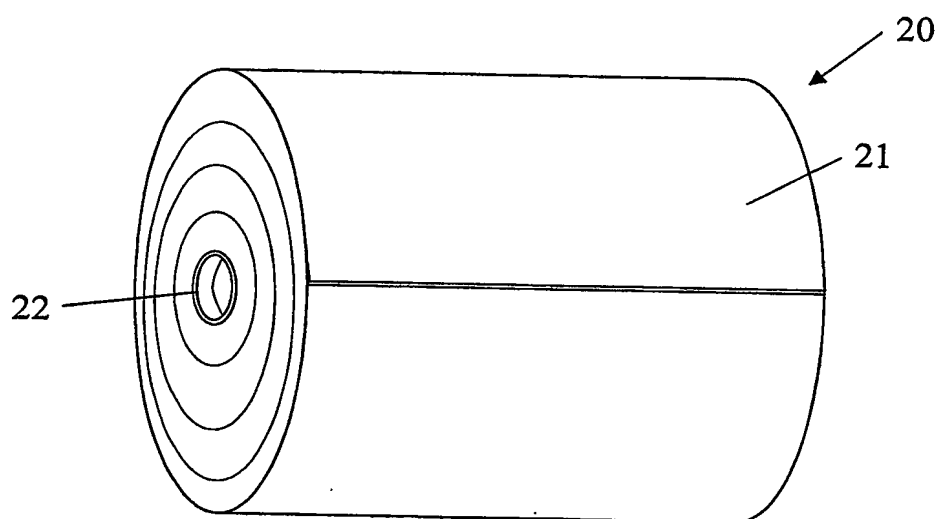
Although this invention has been described by way of example and with reference to possible embodiments thereof, it is to be understood that modifications or improvements may be made thereto without departing from the scope of the invention.



**Figure 1**



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**Figure 2****Figure 3**